

ASSESSMENT OF PARENTS' AND CHILDREN'S ORAL HEALTH-RELATED BEHAVIOR

Yuanita Lely Rachmawati^{1,2}, Anton Rahardjo³, Diah Ayu Maharani³

¹Graduate School, Faculty of Dentistry, Universitas Indonesia, Indonesia

²Department of Community and Preventive Dentistry, Faculty of Dentistry, Universitas Brawijaya, Indonesia

³Department of Preventive and Public Health Dentistry, Faculty of Dentistry, Universitas Indonesia, Indonesia

ABSTRACT

OBJECTIVE: This study aimed to perform an oral health questionnaire based on cross-cultural adaptation of knowledge, attitudes, beliefs, and behaviors to determine associations between parents and their children.

MATERIAL AND METHODS: This was a cross-sectional study, in which a self-administered questionnaire was utilized followed by examination for dental caries. The study included 281 subjects of 12-13 years old and their parents. The ICC and Cronbach's α values of the adolescents were 0.78 and 0.82, and those of the parents were 0.77 and 0.80 respectively.

RESULTS: There is a significant difference between mothers' educational level and children caries, and a correlation between knowledge, attitudes, and behaviors of parents and their child. This study supported the reliability and validity of the Indonesian questionnaire of knowledge, attitudes, belief, and behaviors for parents and their child, without exhibiting a ceiling or floor effect.

CONCLUSION: There is a correlation between knowledge, attitudes, and behaviors of parents and their child.

KEY WORDS: oral health, behavior, knowledge, attitudes, validity, reliability.

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INTRODUCTION

Parents' habits and knowledge about oral health have been shown to influence the oral health status of their children [1]. Specifically, parents' favorable attitudes towards the importance of oral hygiene, controlling their children's tooth brushing, and sugar-snacking habits represents the most significant predictor of children's favorable habits [1]. Additionally, family's low socioeconomic status [2] and parents' poor oral health habits [3] have also been found to contribute to the development of caries. Furthermore, other factors such as gender [4] and multiple levels of influence, includ-

ing time or developmental dimensions [5], may play a role. It has been shown that the family creates an environment necessary for a healthy lifestyle, increases self-confidence, and helps habit formation [6]. Importantly, parental skills and attitudes toward oral hygiene may have an impact on the formation of their children's oral hygiene habits and the prevalence of oral diseases [7]. Specifically, children with poor oral health habits are more likely to develop dental caries than those with favorable habits [3]. Children's adoption of consistent behavioral habits begins at home with their parents, especially the mother, having a great influence on the child's oral health behavior. Additionally, it has

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ADDRESS FOR CORRESPONDENCE: Diah Ayu Maharani,
Department of Preventive and Public Health Dentistry, Faculty of Dentistry,
Universitas Indonesia, 10430 Jakarta, Indonesia,
e-mail: diah.ayu64@ui.ac.id

been shown that parents' education level significantly affects the presence of oral disease in children [8]. A previous study assessed the status of dental erosion in a 12-year-olds in Jakarta-Indonesia, demonstrating that lower levels of parental dental knowledge, lower father's education, and being a girl were positively associated with dental erosion [9].

Most studies correlate parents' knowledge, behavior, education, or socioeconomic status with children's oral health [3, 6, 7]. To date, only rare studies, including in Indonesia, have focused on the association between knowledge and attitudes, beliefs, and children/parents' behavior related to oral health [10]. Several studies have developed instruments to measure knowledge, attitudes, or beliefs related to oral health [1, 6, 7, 10]. In the present study, we performed a cross-adaptation of the instruments developed by Poutanen *et al.* This instrument has been shown to be valid and reliable, following testing on parents and their children aged 11-12 years old [10].

OBJECTIVE

The objective of this study was to perform a cross-cultural adaptation of a knowledge, attitudes, beliefs, and behaviors questionnaire related to oral health, and subsequently identify possible associations between parents and their children at 12-13 years of age.

MATERIAL AND METHODS

We performed a cross-sectional study using self-administered questionnaires to adolescents and their parents. The Ethics Committee of the Faculty of Dentistry, Universitas Indonesia approved this study (No. 129/Ethical Approval/FKGUI/XII/2017 No. Protocol 071421117). Questions concerning oral health-related knowledge, attitudes, beliefs, and behaviors were measured on a 4-point Likert scale, with 4 possible answers: strongly agree, partly agree, partly disagree, and strongly disagree. Behavior was evaluated with the use of structured and open-ended questions. Enquiries about parents' highest level of education took place. When performing the statistical analyses, variables concerning knowledge, attitudes, and beliefs were dichotomized (strongly agree = 0, partly agree, partly disagree, strongly disagree = 1). Additionally, variables regarding behaviors were dichotomized as follows: tooth brushing (twice a day = 0, once a day or seldom = 1), xylitol products use (parents: twice a day = 0, once a day or seldom = 1; children: at least once a day = 0, not daily = 1), consumption of sweets (once a week = 0, 2-3 times per week or more often = 1), soft drink use (2-3 times per week = 0, daily = 1) [10].

The sample size estimation suggested that the enrollment of 256 individuals in the study would be necessary to reach statistical significance ($p < 0.05$), with a 95%

confidence, assuming a significant correlation of 0.4. In total, 281 individuals fulfilled the inclusion criteria and were enrolled into the study. This represents an additional 10% over the total sample size needed for statistical significance. The enrolled children were adolescents aged 12-13 years, recruited from junior high schools in Jakarta. All the subjects were willing to participate in the study and their parents signed a written informed consent form on their behalf. Medical conditions preventing the participants from answering the questionnaire or any medical or pharmacotherapy history that might compromise the study's outcome were not identified in any of the subjects.

The subjects were visited twice: the first time for the parents to sign the written informed consent, and the second time to initiate the questionnaire and perform examination of caries. Caries were assessed according to the World Health Organization criteria [11]. A single examiner, who was not involved in the research analysis, conducted oral health examinations with a Kappa agreement of 0.94 for decayed, missing, and filled teeth (DMFT) scoring. Data obtained from the questionnaire was coded and inputted in excel program by a single recorder. Eleven junior high schools in Jakarta, representing six districts, were clustered and randomly selected from official school registries. A subset of the subjects was retested to confirm the reliability of the measurements. To this end, 23 adolescents obtained a second questionnaire within 1-2 weeks [12] from receiving the first one. Reliability was analyzed by Cronbach's α and the interclass correlation coefficient.

RESULTS

Our study included 300 adolescents recruited from junior high schools across Jakarta. Of these, 19 were excluded due to refusal to undergo oral examination. The remaining 281 agreed to participate in the study by signing the informed consent form (93.6% response rate). All the interviewed participants completed the Indonesian version of the questionnaire's items, resulting in complete data analysis.

By analyzing the descriptive sociodemographic (Table 1) and clinical data, we observed that DMFT's prevalence was 80.4% and its index had an average of 2.8 teeth, comprising 0.01% of filled teeth and 0.05% of missing teeth. In addition, we found that a higher number of female participants had caries with respect to males. The test-retest reliability was performed on 23 adolescents and their parents. The ICC and Cronbach's α values of the adolescents were calculated to be 0.78 and 0.82; parents were calculated to be 0.77 and 0.80. Good reproducibility and a good internal consistency were observed [13].

Among the parents, mothers (average age, 42 years old) comprised the majority of respondents (70.5%).

TABLE 1. Child's demographic characteristics

Factor	n (%)
Child gender	
Male	134 (47.7)
Female	147 (52.3)
Child age (year)	
12	150 (53.4)
13	131 (46.6)
Child caries	
Without experience	55 (19.6)
With experience	226 (80.4)

TABLE 2. Differences between parents' educational level and children's experience with caries

Factor	Without caries n (%)	With caries n (%)	p value*
Mother			
Primary	5 (11.9)	37 (88.1)	0.011**
Junior high school	11 (18.3)	49 (81.7)	
Senior high school	22 (16.5)	111 (83.5)	
College	17 (37.0)	29 (63.0)	
Father			
Primary	4 (20.0)	16 (80.0)	0.107
Junior high school	6 (9.2)	59 (90.8)	
Senior high school	34 (22.2)	119 (77.8)	
College	11 (25.6)	32 (74.4)	

* χ^2
**Statistically significant with $p < 0.05$

TABLE 3. Score of knowledge, attitudes, belief, and behaviors questionnaire (n = 281)

	Mean ± SD		Min-Max
	Parent	Child	
Sum score knowledge, attitudes, and belief	5.7 ± 5.4	6.7 ± 5.2	0-33
Behavior	1.7 ± 0.7	1.7 ± 0.8	0-4

When evaluating mothers' educational level and children's caries experience, we observed significant differences. On the contrary, this was not observed with the fathers (Table 2). Moreover, floor or ceiling effects were not present in the sample. We believe these results are due to the fact that the percentage of the respondents who achieved the lowest or highest possible score was less than 15% [13]. This lack of floor or ceiling effects also indicated a lack of extreme items in the lower or upper end of the scale, supporting a sufficient validity of the content [13]. The minimum

and maximum score possible for the sum of knowledge, attitudes, and beliefs items were 0 and 51, respectively, while the maximum scores obtained was 33 (Table 3). The minimum and maximum scores possible for behaviors questions were 0 and 4, respectively.

In the questionnaire's responses, we observed that both the parent and the child mostly knew that it is possible to achieve a reduction of the risk of caries by using fluoride toothpaste and omitting one sweet snack a day. In 60.5% of the cases, both the child and the parent knew that to achieve a sufficient supply of fluoride, the guidelines recommend tooth brushing at least twice a day. In almost 50% of the pairs, both of the parties considered tooth brushing important prior to going to school and meeting friends. In 90% of the parent-child pairs, both of the parties reported brushing their teeth with fluoride toothpaste at least twice a day (Table 4). Finally, the present study also found a significant correlation between knowledge, attitudes, belief, and behaviors of the parent and child (Table 5).

DISCUSSION

The results of our cross-cultural adaptation of knowledge, attitudes, belief, and behaviors questionnaire in Indonesian adolescents and their parents, demonstrate the validity and reliability of the psychometric properties of the Indonesian version. These results are in line with the English version. Additionally, both the Indonesian and English language versions were semantically similar. In the present study, we did not observe floor or ceiling effects [13]. Our results demonstrate the presence of a positive correlation between knowledge, attitudes, belief, and behaviors among parents and their child. A good knowledge attitudes, belief, and behaviors of parents reflected a better knowledge attitudes, belief, and behaviors of the children. Research performed in previous studies has shown that rather than parents' knowledge and attitudes, it was the reported behaviors that were more strongly associated with their children's own reported behaviors. These results support the findings that a child's behavior is learned from his/her parents [10].

Similar to previous studies, the majority of the responding parents were the mothers [10]. We observed a significant difference between parents' educational level and children's caries experience. Specifically, for the mothers only, parent's education level was found to be statistically significant as a predictor of caries. This finding can be explained by the fact that mothers' education is linked to an increased knowledge of healthy behaviors, followed by an increased ability to monitor and maintain their children's dental health. Children whose mothers reached senior high school or university had statistically significantly lower levels of dental caries than those whose mothers reached only high school education [14]. Previous studies have also shown that

TABLE 4. Numbers and percentages of child (C)-parent (P) pairs according to their oral health-related knowledge, attitudes, belief, and behaviors (both favorable, child not favorable and parent favorable, child favorable and parent not favorable, and both not favorable)

Statement	P+ C+ n (%)	P+ C- n (%)	P- C+ n (%)	P- P- n (%)	p value*
Knowledge					
A person can reduce the risk of caries by using fluoride toothpaste	122 (43.4)	65 (23.1)	42 (14.9)	52 (18.5)	0.033**
A person can reduce the risk of caries by using xylitol products after meals	42 (14.9)	43 (15.3)	42 (14.9)	154 (54.8)	1.000
For sufficient fluoride supply one has to brush teeth at least twice a day	170 (60.5)	68 (24.2)	24 (8.5)	19 (6.8)	< 0.001**
A person can reduce the risk of caries by omitting one sweet snack a day	96 (34.2)	69 (24.6)	45 (16.0)	71 (25.3)	0.031**
Attitude					
Brushing teeth is very important for me because then I feel fresh	217 (77.2)	47 (16.7)	15 (5.3)	2 (0.7)	< 0.001**
Brushing teeth is very important for me when going to a dentist	117 (41.6)	63 (22.4)	36 (12.8)	65 (23.1)	0.009**
Brushing teeth is very important for me because then I would not get caries	213 (75.8)	41 (14.6)	21 (7.5)	6 (2.1)	0.015**
Brushing teeth is very important for me when going to a party	123 (43.8)	53 (18.9)	38 (13.5)	67 (23.8)	0.142
Brushing teeth is very important for me because then my breath is fresh	202 (71.9)	63 (22.4)	12 (4.3)	4 (1.4)	< 0.001**
Brushing teeth is very important for me when going to school/work	200 (71.2)	46 (16.4)	19 (6.8)	16 (5.7)	0.001**
I would be distressed if I got caries	132 (47.0)	92 (32.7)	19 (6.8)	38 (13.5)	< 0.001**
Brushing teeth is very important for me because then my gingiva is healthy	213 (75.8)	46 (16.4)	15 (5.3)	7 (2.5)	< 0.001**
Brushing teeth is very important for me because then my appearance is better	171 (60.9)	49 (17.4)	40 (14.2)	21 (7.5)	0.397
Brushing teeth is very important for me because then I avoid tooth discoloration	171 (60.9)	61 (21.7)	22 (7.8)	27 (9.6)	< 0.001**
Brushing teeth is very important for me when going to meet my friend	123 (43.8)	69 (24.6)	42 (14.9)	47 (16.7)	0.013**
Brushing teeth is very important for me when going to sports/hobbies, etc.	102 (36.3)	60 (21.4)	46 (16.7)	72 (25.6)	0.246
Belief					
I believe I can keep my own teeth for my whole life	216 (76.9)	18 (6.4)	20 (7.1)	27 (9.6)	0.871
Behavior					
I brush teeth with fluoride toothpaste at least twice a day	255 (90.7)	6 (2.1)	14 (5.0)	6 (2.1)	0.115
I eat sweets once a week or more seldom	10 (3.6)	24 (8.5)	44 (15.7)	203 (72.2)	0.021**
I use xylitol gum at least twice a day	56 (19.9)	41 (14.6)	55 (19.6)	129 (45.9)	0.184
I drink soft drinks 2-3 times per week or more seldom	216 (76.9)	33 (11.7)	16 (5.7)	16 (5.7)	0.021**

*McNemar's test for the differences between child-parents' pair

**Statistically significant with $p < 0.05$

educational level of parents influences children's oral health [15-18]. The high percentage of mothers involved in the study may have influences the results because mothers are considered as role models, transferring values, norms, and attitudes that are, then, accepted by the children [19].

The findings obtained in the present study are in line with earlier research showing an association between mothers' oral health attitudes and their young children's caries experience [20]. Additionally, mothers' oral health status has been shown to be a strong predictor of their children's oral health status [21]. The children whose parents had a higher educational level brushed their teeth every day twice as many times more frequently than those of the parents with a lower educational level [6]. Additionally, findings in a Norwegian study have shown that parental education

TABLE 5. Correlation of knowledge, attitudes, belief, and behaviors between child and parents

	Child's knowledge	Childs attitude	Child's belief	Child's behavior
Parent's knowledge	$p = 0.001^*$ $r = 0.206$			
Parent's attitude		$p < 0.001^*$ $r = 0.359$		
Parent's belief			$p < 0.001^*$ $r = 1.000$	
Parent's behavior				$p < 0.001^*$ $r = 0.220$

p-value for Spearman's correlation

*Statistically significant with $p < 0.05$

and socioeconomic status had an impact on a child's oral health [22]. Specifically, parents with a higher educational level and higher income knew more about the prevention of dental caries by keeping one's teeth healthy. Moreover, these parents were more involved in their children's oral hygiene [23]. Children with caries had lower family incomes and less educated parents [24]. Additionally, an inadequate and poor nutrition has a considerable impact on the development of dental caries. Specifically, school children love snacking, do not follow healthy dietary habits, and like sticky, sweet food. It is well known that all of these habits will have a negative impact on the children's teeth [25]. Insufficient parental education and low-socioeconomic status contribute to poor dietary habits and an unhealthy lifestyle [26]. Importantly, parental attitudes toward oral health depend on their education. A systemic review reported that better educated parents are more attentive to their children's oral health [8].

Moreover, studies have reported that children's oral health is directly affected by both parental education and family socioeconomic factors [27, 28]. Low-education and low-income families are less attentive to basic dental care measures and regular preventive check-ups with the dentist, resulting in the development of dental caries [29]. The present study has some limitations. Specifically, we have not explored socioeconomic factors. Future studies are needed to measure the correlation of knowledge, attitudes, belief, and behaviors of the adolescents with parents' socioeconomic status. Furthermore, a larger sample set is necessary, to better reflect the Indonesian community.

CONCLUSIONS

This study provided evidence to support the reliability and validity of the Indonesian questionnaire of knowledge, attitudes, belief, and behaviors for parent-child pairs. Importantly, it did not exhibit a ceiling or floor effect. Mothers comprise the majority of the respondents and significant differences were observed between mothers' educational level and children caries experience. Our results demonstrate the presence of a significant correlation between knowledge, attitudes, belief, and behaviors of parents and their child.

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CONFLICT OF INTEREST

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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